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European Sociological Review, 2017, Vol. 33, No. 5, 675–692
doi: 10.1093/esr/jcx067
Advance Access Publication Date: 1 September 2017
Original Article

Cross-National Variations in the Security Gap: Perceived Job Insecurity among Temporary and Permanent Employees and Employment Protection Legislation

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Submitted April 2016; revised July 2017; accepted April 2017

Abstract

It is often shown that temporary employees generally perceive their job insecurity to be higher than permanent employees. However, substantial variations in this perceived job security gap exist between countries. This article engages with this knowledge and adds to it by focusing on these country variations and asking what role the strength of employment protection legislation (EPL) has both on the size of the job security gap and in explaining country differences. The developed hypotheses suggest that the two components of EPL—job security provisions, indicating the 'protection gap' between permanent and temporary employees as well as specific regulations on the use of temporary contracts—will increase the job security gap. These hypotheses are tested using data from the European Social Survey for 2004 and 2010 and data on employment regulations from the Organisation for Economic Co-operation and Development. Compared to existing studies, this article offers a more detailed look at the operationalization of job security provisions and regulations on temporary employment—proposing an alternative measurement which is more closely related to the theoretical arguments. By using this more elaborate operationalization, the multilevel model shows that the gap in perceived job security between temporary and permanent employees systematically increases with respect to the two components of EPL.

Introduction

Over the past decades, most European countries, faced with a growing demand for more flexibility, introduced so-called 'partial' or 'targeted reforms' that loosened regulations on the use of temporary contracts while still leaving job security provisions for permanent workers largely untouched (Maurin and Postel-Vinay, 2005). These reforms made it easier for employers to increase the flexibility of their workforce by using fixed-term contracts (FTCs). This resulted in increasing numbers of temporary employees in Europe, which has created 'flexibility at the margin' (Sala et al., 2012).

This study evaluates the consequences of these temporary contracts on perceived job insecurity and the moderating role of the two different components of employment protection legislation (EPL): job security provisions and regulations on temporary contracts.

Employees with temporary contracts face a higher probability of becoming unemployed (OECD, 2006), even after taking a number of observable (Giesecke and Groß, 2003) and unobservable factors into account (Gash and McGinnity, 2007). Consequently, these employees report higher subjective job insecurity levels than permanent workers (Anderson and Pontusson, 2007; Erlinghagen, 2008; Esser and Olsen, 2012). In this study, subjective job insecurity refers to the cognitive evaluation that the current job will be lost involuntarily (for more details, see Anderson and Pontusson, 2007; Dixon et al., 2013).

This gap in subjective job insecurity is an essential dimension of social inequality, since its negative effects extend far beyond work into various other domains of life. Employees who perceive their job to be insecure report lower job satisfaction (De Witte and Näswall, 2003; Sverke et al., 2002); suffer from decreased psychological and physical health (Buffel et al., 2015; De Witte et al., 2015) as well as lower well-being and life satisfaction (Carr and Chung, 2014; De Cuyper and De Witte, 2007); they also display differences in life planning, especially with respect to delaying long-term commitments, such as having children, getting married, or buying a house (Lozza et al., 2013). Since these negative consequences are not caused by objective job insecurity—such as temporary employment itself—but by perceived job insecurity (Golsch, 2003), knowledge about the perceptions of these FTCs on job insecurity is essential for understanding how strongly temporary employees are disadvantaged compared to permanent employees.

Although numerous studies have found a gap in perceived job insecurity between permanent and temporary employees (Anderson and Pontusson, 2007; Erlinghagen, 2008; Esser and Olsen, 2012), knowledge about differences across countries is sparse (Chung and Mau, 2014: 312). Since the implications of temporary employment on the risk of job loss vary drastically across countries due to the strong variations in EPL (Blanchard and Landier, 2002; Centeno and Novo, 2012), the effect of temporary employment on perceived job insecurity cannot be expected to be constant across national contexts. In this case, the detrimental effect of temporary employment on various areas of life would also be expected to be much stronger in these countries.

The present study adds to current knowledge by analysing country differences in the size of the effect of temporary versus permanent employment, and by evaluating the role of *job security provisions* and *regulations on temporary contracts*.

The following sections develop hypotheses about how these two components of EPL influence the gap between temporary and permanent employees with respect to perceived job insecurity. The 'Methods' section explains how these two components of EPL are operationalized, since this study argues that the standard approach of simply using the additive indices provided by the Organisation for Economic Co-operation and Development (OECD) is problematic, and the items 'definition of unfair dismissals' and the regulations on temporary contracts (with respect to the maximum number of successive temporary contract and the maximum cumulative duration of temporary employment) are better suited for testing the hypotheses. Considerable country-related variations are found in the perceived job insecurity of permanent and temporary employees. The multilevel model of the present study shows that both components of EPL—job security provisions and regulations on temporary contracts—increase the gap in perceived job insecurity of temporary and permanent employees. Finally, the implications of these findings are discussed.

Empirical Findings and Theoretical Considerations

Perceived Job Insecurity: Its Causes and Gaps in the Literature

Subjective job insecurity is a multi-dimensional concept (Chung and Mau, 2014: 305; for an overview, see Anderson and Pontusson, 2007). Many scholars have pointed to the importance of distinguishing between the cognitive and affective aspects of job security (Anderson and Pontusson, 2007; Näswall and De Witte, 2003). The *cognitive aspect*—the perceived probability that the current job will be involuntarily lost—will be concentrated on here. This perceived job insecurity is an employee's subjective evaluation of his/her individual resources and the institutional context with respect to the likelihood of losing the current job. Factors influencing this assessment can be situated at the individual level, the level of the firm, or the country level.

At the individual level, a temporary (compared to permanent) contract is usually one of the factors that increases job insecurity the most (Anderson and Pontusson, 2007; Green et al., 2000; Erlinghagen, 2008; Esser and Olsen, 2012). Therefore, it is important to understand the conditions for which this is the case.

Previous research has argued that perceived job insecurity stems from a relative lack of power (Dixon et al., 2013: 1055). This approach matches with previous findings concerning the individual level. Employees who possess marketplace and workplace bargaining power

(Wright, 2000), e.g. in the form of knowledge and skills that are valuable to the company, experience less job insecurity (Green et al., 2000). This finding also can be expressed as a simple rational choice argument: as long as a company expects the utility of keeping an employee to be higher than dismissing her/him, his/her job will be (and will be perceived to be) secure.

In addition to the individual characteristics of an employee, this rational choice calculation will also be influenced by country-level characteristics. In particular, the economic situation of a country and its labour legislation can be expected to influence decision-making. The economic situation will impact the utility of keeping an employee. Consistent with this, a high unemployment rate has been found to increase perceived job insecurity (Berglund, 2015; Green et al., 2000; Erlinghagen, 2008; Esser and Olsen, 2012). On the other hand, EPL determines the possibilities and costs of keeping and dismissing employees. Since rules for dismissal differ immensely for permanent and temporary contracts, it seems evident that employees would be affected differently. However, studies looking in this direction have found only weak evidence. We know that a high unemployment rate and strict EPL reduce satisfaction regarding job security only for temporary, not permanent, employees (Clark and Postel-Vinay, 2009). Studies that have identified significant effects on related questions (Berglund, 2015; Chung and van Oorschot, 2011) do not include a random slope for temporary employment in the multilevel models, which however leads to a severe underestimation of the confidence intervals. The results indicate that the effect of temporary employment on job insecurity is stronger in countries with strict EPL (Berglund, 2015) and stronger on employment security in countries with strict regulations on permanent employment (Chung and van Oorschot, 2011). If the random slope is included, however (using the same dataset), employment regulations do not seem to explain differences in employment security between permanent and temporary employees (Chung, 2016). Additionally, these studies have a broader scope, concentrate more on the macro level and do not concentrate on EPL. This study looks at the connection more closely from a micro-level perspective and asks: Can EPL explain the effect heterogeneity of having a temporary contract? Additionally, it is also important to take a closer look at the measurement of EPL when studying this connection. EPL incorporates different dimensions. Recent research points to the importance of differentiating between regulations on the use of temporary contracts and job security provisions for permanent contracts (Noelke, 2016). Additionally, it is necessary to choose an operationalization more closely related to the theoretical concepts than previous studies have done. In the next two sections, hypotheses are developed concerning how job security provisions for permanent contracts and regulations on the use of temporary contracts influence the gap between permanent and temporary employees.

EPL, Job Security Provisions, and the Protection Gap

Generally, EPL is often expected to increase job security, since it limits companies' ability to hire and fire at will; however, in most studies, EPL is unrelated to perceived job insecurity (Dixon et al., 2013; Erlinghagen, 2008; Esser and Olsen, 2012); only one study has found that EPL decreases job insecurity (Anderson and Pontusson, 2007). However, these studies suffer from two shortcomings: first, they do not distinguish between the effects of EPL on permanent and temporary employees, and second, they use an index that includes both dimensions of EPL—job security provision and regulations on temporary contracts. The theoretical arguments, however, usually rely on the effect of job security provisions in decreasing job insecurity, and the role of regulations on the use of temporary contracts is neglected. Therefore, it is important to look at both dimensions separately.

Job security provisions reduce the permeability of the barrier between work and unemployment (Clark and Postel-Vinay, 2009). However, numerous labour market theories, such as segmentation theory (Althausen and Kalleberg, 1981), differentiate between groups within the labour market, which could be affected differently. Typically, temporary contracts are seen as an attribute of the secondary labour market (Giesecke and Groß, 2003). The consensus among economists is that job security provisions deepen the gap between the unemployed and the employed. Additionally, these provisions also should widen the gap between temporary and permanent employees. In contrast to temporary contracts, which have an expiration date, permanent contracts are open ended. Therefore, if an employer wants to dissolve an employment relationship, permanent employees have to be actively dismissed, while temporary contracts expire if no action is taken.

For permanent employees, job security provisions should increase perceived job security, since they increase dismissal costs (Gebel and Giesecke, 2011; OECD, 2013). The more difficult it is to dismiss employees, the less likely it is that they will lose their job because it would be complicated and costly for the firm. By increasing dismissal costs, job security provisions

lower the threshold to which the utility of an employee can decline before she/he is dismissed (Cahuc and Zylberberg, 2004). These job security provisions for permanent employees can be interpreted as bargaining power on the part of employees. If perceived job insecurity stems from a lack of power (Dixon et al., 2013: 1055), job security provisions should decrease job insecurity for permanent workers. However, the situation is entirely different for temporary employees. Since, by definition, temporary contracts end automatically at a set date without any further employer obligations, job security provisions only protect temporary employees during the length of their contract. Once their contract ends, dismissal protection no longer applies and therefore can offer no protection. In contrast, if employers want flexibility on the number of people they employ and reduce their workforce, it is rational and the least costly to let the fixed-term employees go, since the expected costs of dismissing permanent employees are higher than not renewing the contracts of temporary employees. These predictions are based on the simple rational choice considerations of employers. If dismissal costs at the end of a temporary contract equal zero, the difference in dismissal costs between permanent and temporary employees equals the job security provisions for permanent employees. This difference constitutes the 'protection gap' between the two groups. Assuming, employees foresee these calculations made by the employer—this leads to the following hypothesis:

Hypothesis 1. The negative effect of temporary employment on perceived job security is stronger in countries with substantial differences in the dismissal costs between temporary and permanent employees (strong job security provisions).

Regulations on Temporary Contracts

Strict regulations on the use of temporary contracts are designed to prevent employers from the excessive use of these contracts that replace permanent jobs with temporary jobs. The regulations define which kind of work can be temporary and limit the number of successive temporary contracts and the cumulative duration of one employee with one employer. The last two aspects of these rules may be problematic for employees holding temporary contracts. If a successive temporary contract is not possible, employers face the decision of whether to transform the temporary contract into a permanent one or let the employee go. Especially when job security provisions are strong, transforming a temporary to a permanent contract increases dismissal costs steeply. Empirical evidence suggests that employers often prefer to hire on a temporary basis for the same position and replace the current temporary employee with a new one if a successive temporary contract is no longer possible (Blanchard and Landier, 2002; Centeno and Novo, 2012). Assuming that temporary employees recognize these considerations of their employer, either because it has been communicated to them or because they know about similar cases, this leads to the following hypothesis:

Hypothesis 2. The negative effect of temporary employment on perceived job security is stronger in countries with strict regulations on temporary contracts.

Data, Methods, Measurements

The analyses in the present study are based on individual-level data from Round 2 (2004) and Round 5 (2010) of the European Social Survey (ESS), both containing the rotating module 'Family, work and well-being' (ESS, 2010; for documentation of the data, see: ESS, 2014). The ESS is a cross-national survey including 27 countries in 2010 and 25 countries in 2004.

These data sets are combined with country-level data. Countries, for which no comparable country-level data (for EPL) are available, are excluded from the analysis (for an overview, see Table A3). The sample used here is restricted to employees between 15 and 67 years, and the target population includes 29,639 employees (2010: 17,370 in 22 countries; 2004: 12,269 employees in 17 countries). List-wise deletion is used, so due to missing data on the dependent and independent variables, 23,978 cases are available for analysis.

Outcome Variable

The dependent variable *job insecurity* is measured by asking whether the statement 'My job is secure' is not at all, a little, quite, or very true. Of the study's sample, 14 per cent feel very insecure, 21 per cent a little insecure, 34 per cent hardly insecure, and 31 per cent not at all insecure. However, a considerable variation exists across countries. Figure 1 shows the proportion of permanent employees (solid bars) and the proportion of temporary employees (grey bars) who report that their job is very insecure. With only one exception, in all countries and both years, temporary employees feel more insecure than their permanent counterparts. However, the differences between the two groups vary considerably. The numbers to the right of the grey bars are the ratio of

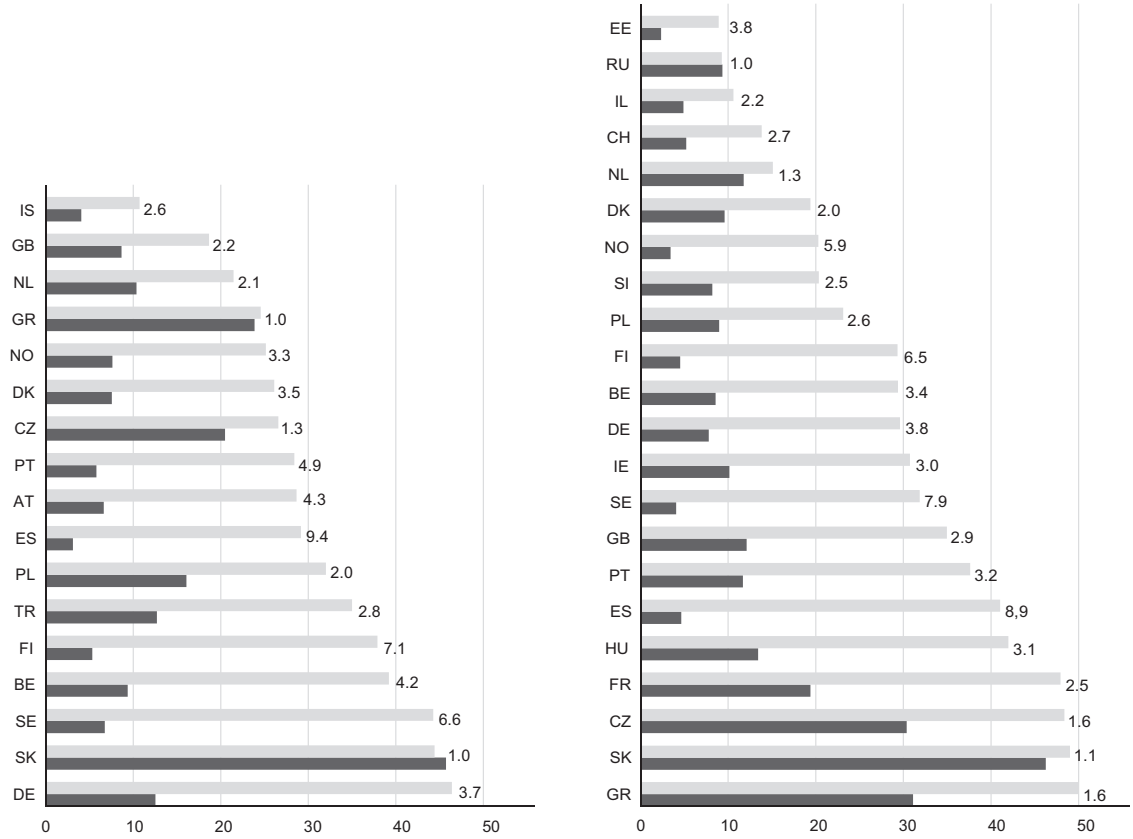

Figure 1. Distribution of perceived job insecurity

Note: Percentage of people in each country who judge their job to be very insecure.

Source: Weighted results ESS 2004 (left) and ESS 2010 (right).

how many temporary employees feel insecure compared to their permanent counterparts.

In both 2004 and 2010, the largest ratio is found in Spain, where temporary employees are eight to nine times more likely than permanent employees to experience job insecurity.

Measurement of Job Security Provisions and Regulations on Temporary Contracts

The country-level data for *job security provisions* and *regulations on temporary contracts* measure the strictness of legislation in place on 1 January 2004, and 2010, respectively. These data are provided by the OECD (OECD, 2016; for details on the methodology, see OECD, 2013, 2014; Venn, 2009). The OECD provides 21 items, measuring different components of EPL that are combined into three additive indices on the strictness of EPL (for regular employment, temporary employment, and collective dismissals). These generalizations by construct indices have been used in previous studies on related questions (Berglund, 2015; Chung, 2016; Chung and van Oorschot, 2011). However, since they do not correspond very well to the theoretical argument set out here regarding the 'protection gap', the items are looked at to operationalize and test the hypotheses (see Table A1 for an overview of the items and indices).

Job security provisions

Of the nine items measuring EPL (for regular employment), the best-suited item for measuring job security provisions is *definition of unfair dismissal*, which is measured on a scale from 0 (no regulation) to 6 (strict regulation) and describes under which circumstances it is possible to dismiss employees. If a dismissal is just, it cannot be overturned by a court and therefore most

accurately measures the legal protection gap. If worker capability and the redundancy of the job are adequate grounds for dismissal, all other factors should carry very little weight for dismissal costs. Within the index 'EPL regular' however, this item only carries a very small weight. The other items (which constitute more than 90 per cent of the index) measure various aspects of dismissal regulations but not protection against dismissal and are therefore disregarded.

Two items measure the consequences of an unfair dismissal. However, strong repercussions following unfair dismissal do not protect employees, if the threshold in court, to consider a dismissal unfair, is extremely high; in this case, *definition of unfair dismissal* assumes the value 0.[1] Another item—*duration of trial period*—measures the time when the protection gap does not exist but does not measure its size.

Two-thirds of the index 'EPL regular' consist of 'procedural inconveniences' and 'notice periods and severance pay'. Procedural inconveniences, such as notification and consultation requirements, are inconvenient for the employer but do not protect employees from losing their job if a dismissal is defined as just. Notice periods and severance pay (for just dismissals) impose dismissal costs; however, in some countries, temporary employees also are entitled to severance pay at the end of their contract, so severance pay does not cause a protection gap between permanent and temporary employees. Even though notice periods delay dismissals, they do not prevent them. Additionally, this indicator assumes its maximum (coded with 6) at more than 3.5 months. This should not increase dismissal costs noticeably.

In the present study sample, almost half the countries are coded with 0, which means that regarding the *definition of unfair dismissal*, worker capability and the redundancy of the job are adequate and sufficient reasons for dismissal. In another large group, 'a transfer and/or retraining to adapt the worker to different work must be attempted prior to dismissal' is coded with 4 (see Table A2 for the coding scheme; see Table A3 for country characteristics).

Regulations on temporary contracts

The strictness of the regulations on temporary contracts is measured by an additive index, which combines two items (of the eight items measuring EPL for temporary employees)—the maximum number of successive contracts and the maximum cumulative duration (for more details, see OECD, 2013; Venn, 2009). The two are 'strategic substitutes'—independent strategies for countries to limit the use of temporary contracts of an employee with one company.[2] This independence also shows in the correlation of the two dimensions (−0.22), so countries use one of the two strategies. These two items make up only 25 per cent of the normally used index 'EPL temporary'. The other items measure various aspects of temporary work regulations that are not related to limitations of temporary contracts with one company. One item indicates regulations on what type of work is allowed to be temporary. This regulation prevents employers from replacing permanent jobs with temporary jobs and regulates entry into temporary employment, but it should not impact employees who hold a temporary contract. Other items measure regulations on temporary work agency employment, which is also not related to the present argument.

Within this study's sample, the strictness of the regulations on temporary contracts ranges between 0 and 4.

As an additional robustness check, the two dimensions of EPL regulations—job security provisions and regulations on temporary contracts—are also combined into three *employment protection types*, differentiating between *regulated labour markets*, *partially deregulated labour markets*, and *flexible labour markets* (see Supplementary Appendix for discussion and results).

Control Variables

This study relies on previous research to identify the variables to be included as controls in the multilevel model. On the individual level, previous research has found that company-specific human capital (Green et al., 2000) (measured by tenure or training period) reduces job insecurity, whereas general human capital (measured by years of education or educational degree) is unrelated to job security (Green et al., 2000; Erlinghagen, 2008; Esser and Olsen, 2012) as long as specific human capital is controlled for. Previous spells of unemployment increase perceived job insecurity (Chung and van Oorschot, 2011; Erlinghagen, 2008), which indicates that past experiences can sensitize individuals. The results concerning gender, age, having children, and part-time employment (Anderson and Pontusson, 2007; Green et al., 2000; Erlinghagen, 2008) are inconclusive—most likely no effects or only small effects are attributable to these characteristics. However, they are still included as controls. So, on the individual level, general human capital, specific human capital, age, part-time employment, sex, having a child, and unemployment experiences are all included as controls.

At the company-level, perceived job insecurity has been found to be lower in larger companies (Green et al., 2000). Differences also seem to exist across

different industries (Erlinghagen, 2008). Therefore, company size and industry are included as controls.

To gain unbiased estimates of the security gap, all macro-level variables that (i) have a causal effect on the outcome variable (which is the size of the security gap) and (ii) the independent variables of interest (job security provisions and regulations on temporary contracts) have to be controlled.

To identify factors that could influence the size of the security gap, theoretical arguments are considered. Additionally, factors that have so far been shown to influence perceived job insecurity are looked at more closely. At the country level, previous research has found little evidence for strong predictors—except for the unemployment rate. It is possible that permanent and temporary employees might be affected differently, as it is more difficult to terminate permanent employees, compared to not renewing FTCs. If an imbalance in labour demand and supply exists, temporary employees are especially at risk of not having their contract renewed. Therefore, both the main and the interaction effect of the *unemployment rate* (the percentage of the labour force aged 15–74 years who are currently unemployed but actively seeking work), provided by the International Labour Organization (ILO, 2015) are included as controls.

According to previous studies, factors such as *aggregated job stability*, gross domestic product (*GDP) growth*, *social security* (Erlinghagen, 2008), and *unemployment benefits* (Esser and Olsen, 2012) are unrelated to perceived job insecurity. Although some indications exist that *union density* and *part-time rate* decrease perceived job insecurity (Dixon et al., 2013; Esser and Olsen, 2012), these results are quite sensitive to the other indicators included in the study. Even if they do not influence levels of job insecurity, they may still influence the gap between permanent and temporary employees with respect to job insecurity. However, a strong argument for any of these or other factors has not been made, or any evidence found. Therefore, they are not included as controls.

The most likely of these factors to influence the perceived security gap is *GDP growth*. It identifies the economic climate and might influence insecurity mainly by affecting unemployment. This factor however is already controlled for more directly by including the *unemployment rate*.

Methods

Since the data are clustered in countries, a multilevel model is estimated. To maximize the number of cases on the macro level, the samples for 2004 and 2010 are pooled, and country-years are used as the second level. To check for robustness, however, the models are also calculated separately for both years (see Supplementary Appendix).

Although job insecurity is only measured on a four-point answering scale, a linear multilevel model is used, since the focus of the study is on interaction effects and ordinal models make interaction terms extremely difficult to present and interpret. In contrast to the commonly used binary model, this approach does not discard information. To check for robustness, results from the linear model were compared with the ordinal results (see Supplementary Appendix). The latter pointed in the same direction and led to the same conclusions.

Results

At first, empty models are estimated without any covariates. In total, 13.9 per cent of the total variance of job insecurity is due to country-year-level variability, which is a sizeable portion (Raudenbush and Sampson, 1999). In Model 1, only the individual- and company-level controls and the main effects of the country-level variables—job security provisions, regulations on temporary employment, and the unemployment rate—are included, replicating findings of previous research. Model 2 additionally includes the interaction terms to evaluate which factors can explain the variations in the gap in perceived job security between permanent and temporary employees. For both models, a random slope is included for the effect of temporary employment, to see whether effect heterogeneity is present and needed explaining, and if so, what proportion can be explained by the cross-level interactions that are introduced.

The Model 1 results (without cross-level interactions) showed that temporary employees feel considerably more insecure than permanent employees, which confirms the results of previous research (Anderson and Pontusson, 2007; Erlinghagen, 2008; Esser and Olsen, 2012). The variance of the slope of temporary employment is significant, indicating that effect heterogeneity exists that needs to be explained. This model finds that the main effects of both components of EPL—job security provisions and regulations of temporary employment—do not significantly influence perceived job insecurity, which is also in line with previous findings (Dixon et al., 2013; Erlinghagen, 2008; Esser and Olsen, 2012). Also reflecting previous findings (Berglund, 2015; Green et al., 2000; Erlinghagen, 2008; Esser and Olsen, 2012), the unemployment rate significantly increases perceived job insecurity. In Model 2 the interaction terms are included. The results show that the gap in the perceived job insecurity of temporary and

Table 1. Results of the multilevel analysis

	Model 1		Model 2	
	Coeff.	Std. Err.	Coeff.	Std. Err.
Fixed-term contract (FTC)	0.524**	(0.048)	0.211	(0.137)
Country variables				
Job security provisions	−0.004	(0.024)	−0.037	(0.028)
Regulations on temporary employment	0.005	(0.051)	−0.059	(0.059)
Unemployment rate	0.023*	(0.012)	0.023†	(0.014)
Cross-level interactions				
FTC*job security provisions			0.050*	(0.021)
FTC*regulations on temporary employment			0.096*	(0.045)
FTC*unemployment rate			0.001	(0.010)
Individual- and company-level controls are included				
Constant	1.713**	(0.163)	1.917**	(0.184)
Variance components				
FTC (random slope)	0.073	(0.020)	0.057	(0.017)
Country	0.127	(0.032)	0.120	(0.030)
Covariance (FTC, constant)	−0.057	(0.021)	−0.045	(0.020)
Individual	0.830	(0.008)	0.830	(0.008)
Explained variances				
Explained variance of random slope[a]	–		0.227	
R^2 (individual)[b]	0.107		0.110	
R^2 (country)[b]	0.229		0.230	
M	39		39	
N	23,978		23,978	

Note: $^{\dagger}P < 0.10$, $^{*}P < 0.05$, $^{**}P < 0.01$; standard errors in parentheses.

All individual- and company-level controls are included. For complete results, see Appendix A5.

[a]Reduction in variance = $(\text{var}(\text{FTC})_{M1} - \text{var}(\text{FTC})_{M1})/\text{var}(\text{FTC})_{M1}$.

[b]*R*-squared as proposed by Snijders and Bosker (1994: 350–54); also see Snijders and Bosker (1999: 99–105).

Source: Estimations from the random intercept and random slope model (restricted maximum likelihood); ESS 2004 and ESS 2010.

2004: AT, BE, CZ, DE, DK, ES, FI, GB, GR, IS, NL, NO, PL, PT, SE, SK, TR.

2010: BE, CH, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IL, NL, NO, PL, PT, RU, SE, SI, SK.

permanent employees significantly increases with job security provisions and regulations on temporary contracts.

Evidently, temporary employees feel more insecure compared to permanent employees when job security provisions are strong, possibly because they perceive the difference in contractual power between themselves and permanent employees, which confirms *Hypothesis 1*. Temporary employees also experience more job insecurity compared to permanent employees when regulations on temporary contracts are strict, which confirms *Hypothesis 2*. One possible explanation is that temporary employees anticipate that employers would rather dismiss them than make their contract permanent when a successive temporary contract is no longer possible. In total, 23 per cent of the variance of the random slope can be explained by the cross-level interaction terms. These relationships (and especially their size) can best be shown by conditional effect plots (Figure 2). Job security provisions and regulations on the use of temporary contracts vary between their empirical minimum and maximum, respectively. The solid line indicates the predicted effect of temporary employment on perceived job insecurity, and the grey area the 95 per cent confidence interval.

With respect to the strictness of job security provisions (which varies in the present study sample between 0 and 5), the gap increases from 0.42 to 0.67. With respect to the regulations on temporary contracts, the gap increases from 0.35 to 0.73.

These effects are quite strong considering that the dependent variable is only scaled from 1 to 4.

The outcomes from the model using *employment protection types*, which are used as a robustness check (see Supplementary Appendix), confirm the results. The temporary contract penalty is largest in regulated labour markets and smallest in flexible labour markets; in partially deregulated labour markets, the size is in between (see Supplementary Appendix for country characteristics, complete results and discussion).

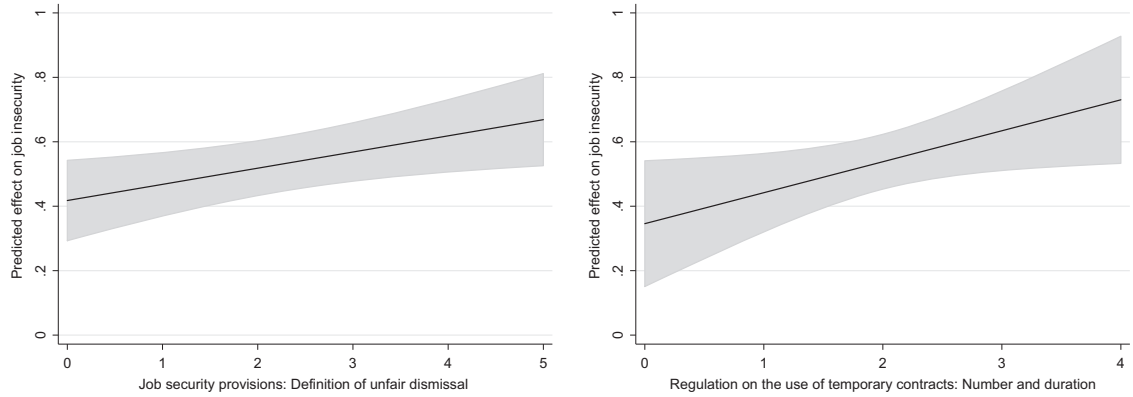

Figure 2. Effect of temporary contracts on perceived job insecurity

Source: ESS 2004 and ESS 2010, based on estimation from Table 1, Model 2.

When looking at the control variables, it is clear that the unemployment rate is not related to the job insecurity gap—it increases insecurity for both temporary and permanent employees. However, there might be a three-way interaction: the unemployment rate will increase the security gap only if job security provisions are strong. Unfortunately, there are not enough cases available at the macro level to test this.

Individual variables confirm the results from previous research. In particular, firm-specific human capital decreases perceived job insecurity, whereas previous unemployment experiences increase it (see Table A5 for a complete regression table).

Multilevel modelling is problematic with a data set including only 39 cases on the macro level, if one is interested in cross-level interactions. As a rule of thumb, usually 50 cases are required on Level 2 if the interest is in interaction effects (Hox, 2010). Here a restricted maximum likelihood estimation is used, which is much more conservative and realistic than a full maximum likelihood estimation. Even though the results are unbiased, the estimates can be rather uncertain (Bryan and Jenkins 2016: 7). The model pooling the two data sets (using 39 country-years), however, yields fairly stable results. When estimating the models separately for each year, the effects are still found but are very uncertain (see Supplementary Appendix).

To check for robustness, the DFBETAs are calculated on the country-year level, for both interaction effects, by alternately dropping country-years and re-estimating the model (see Table A6). There are quite a few influential cases. The interaction effect of temporary employment and job security provisions varies between 0.043 (without Spain 2010) and 0.059 (without Belgium 2004). The interaction effect of temporary employment and regulation of temporary employment is estimated between 0.074 (without the Czech Republic 2004) and 0.112 (without Denmark 2004). Since there is no random sample on the macro level, this constitutes a rough estimation of the credible intervals using a different approach than the confidence intervals.

Additionally, a two-step model is estimated, fitting separate linear regressions on job insecurity in each country-year (including the individual and company level controls) and plotting the effects of temporary employment from these 39 ordinary least squares (OLS) regressions against job security provisions and regulation on temporary employment, respectively (Figure 3).

The graphs can identify influential countries and show the distributions of both the independent variables and the effect of temporary contracts in the different countries.

These diagnostics help to clarify the reliability of the findings. Even though the effects are quite robust, the size of the effects should be interpreted with caution. The sample of countries is not a random sample, and there are influential observations, which strongly influence the estimates. If these countries were excluded, the estimates would change noticeably. Even though pooling the 2 years helps increase the sample size, the confidence intervals and also the credible range of the interaction effects (as indicated by the estimates when dropping influential outliers) are quite large. Therefore replication with other data would be desirable to further narrow the size of the effect (see Replication Package).

Summary, Discussion, and Conclusion

The results indicate that in relation to perceived job insecurity, temporary employees feel more insecure about their job than permanent employees, which is in line with numerous previous findings (Anderson and

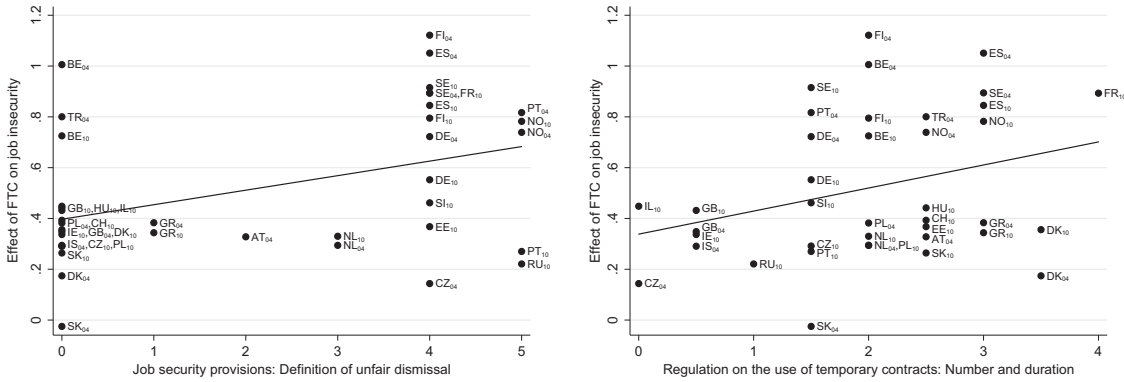

Figure 3. Effect of temporary contracts on perceived job insecurity plotted against both dimensions of EPL

Note: Separate OLS regression were estimated within each country-year including all individual and company-level controls

Source: ESS 2004 and ESS 2010, author's calculations.

Pontusson, 2007; Erlinghagen, 2008; Esser and Olsen, 2012). Additionally, the study finds that this perceived job security gap varies strongly between countries. In contrast to previous studies that have only found weak or no evidence—either because the model does not include the random slope or because no significant effects can be found—the study reveals that the gap between permanent and temporary employees regarding perceived job security significantly increases with strong job security provisions and strict regulations on temporary contracts. This is probably due to two advances made in this study compared to previous research. The operationalization of job security provisions and regulations on temporary contracts, using only the items that are closely related to the theoretical arguments, measure the intended concepts more effectively. Additionally, increasing the number of cases on the macro level by analysing two data sets (ESS 2004 and ESS 2010) yields more exact estimates compared to studies that only use one (usually with fewer than 20 cases on the country level).

This means that the effect of temporary employment is much more pronounced when both components of EPL are strong. These results highlight the need to take country differences regarding the nature of temporary contracts into account when investigating the effects of these contracts on various outcomes (e.g. health, stress, fertility decisions, etc.), since for these outcomes the causal chain includes *perceived* job insecurity.

To evaluate the implications of this finding, one should keep in mind that the share of temporary workers is positively correlated with job security provisions, since these provisions increase the incentives to hire on a temporary basis, which, in turn, increases the percentage of temporary workers and the size of the 'buffer stock' (Polavieja, 2003). Therefore, it can be expected that EPL will lead to a higher segregation of the labour market, since both the detrimental effects of having a FTC and the share of employees affected increase with job security provisions.

Additionally, research has shown that temporary contracts are concentrated among young people (Gash and McGinnity, 2007), which might have severe consequences. Particularly at this stage of both entering the labour market and transitioning into adulthood, a significant number of important decisions—like having children, marriage, and buying a house—will be made that will be influential for decades to come. Therefore, careful planning is of particular importance at this stage (Hellevik and Settersten, 2013), but job insecurity limits the capability to do so freely and effectively.

However, when looking at the distribution of risks associated with the labour market, one should keep in mind that job insecurity is only one aspect. If an employee expects to find a similar or better job immediately, the perspective of losing a current job is less frightening (Berglund, 2015). These expectations are also distributed very unequally; older employees in particular anticipate great difficulties in this regard (Green et al., 2000). For this reason, an equal distribution of job insecurity does not equate to an equal risk distribution concerning perceived labour market risks.

Considering the regulations on temporary contracts (with respect to the cumulative duration of temporary contracts and the number of temporary contracts), the findings of the present study suggest that temporary employees would benefit from deregulation. However, if these regulations were lifted, the potential for temporary

contracts becoming permanent seems even more unlikely, since employers are never forced to make a decision.

The design of the present study has some limitations, however. Concerning the validity of the effect—the study looked at country differences concerning the effects of temporary employment—depending on both components of EPL—in a cross-sectional way. Therefore, causal inferences are difficult to draw, since these models rest on strong assumptions. Future research should, therefore, look at perceptions of job insecurity in a longitudinal study. Although some efforts have been made in this direction (Lübke and Erlinghagen, 2014), a longitudinal research design presents serious challenges: since EPL is quite stable over time (OECD, 2004), there might not be enough variation in the independent variable. Therefore, a design that clearly identifies causal effects is quite difficult to operationalize due to the limitations of available data.

Notes

1 Alternatively, it also would make sense to combine these consequences following unfair dismissal and the probability of unfair dismissal in a multiplicative index. When using this operationalization, the results were very similar (see Supplementary Appendix).

2 To check this assumption, the two items are also separately included in the models. Both items influence job insecurity similarly and can, therefore, be combined (see Supplementary Appendix).

Supplementary Data

Supplementary data are available at *ESR* online.

Acknowledgements

The author would like to thank Christof Wolf, Karin Schuller, Felix Weiss, Maria Leonhardt, and Moritz Balz for their great comments and helpful suggestions on different versions of the manuscript. Furthermore, the author thanks the anonymous reviewers for their suggestions that helped me to improve and clarify my work, and the Editorial Team for their very constructive recommendations. The author bears the sole responsibility for any potential shortcoming in the text or analysis.

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Appendix

Table A1. Strictness of EPL—items and summary indicator weights

Index (Level 2) Scale 0–6	Sub-index (Level 3) Scale 0–6	Item (Level 4) Scale 0–6		Weights version 1 and 2	Weights version 3
Individual dismissals—(regular workers)	Procedural inconveniences (1/3)	1. Notification procedures		(1/2)	(1/2)
		2. Delay to start a notice		(1/2)	(1/2)
	Notice and severance pay for no-fault individual dismissals (1/3)	3. Notice period after	9 months	(1/7)	(1/7)
			4 years	(1/7)	(1/7)
			20 years	(1/7)	(1/7)
		4. Severance pay after	9 months	(4/21)	(4/21)
			4 years	(4/21)	(4/21)
			20 years	(4/21)	(4/21)
	Difficulty of dismissal (1/3)	5. Definition of unfair dismissal		(1/4)	(1/5)
		6. Trial period		(1/4)	(1/5)
		7. Compensation		(1/4)	(1/5)
		8. Reinstatement		(1/4)	(1/5)
		9. Maximum time for claim		–	(1/5)
Temporary contracts	FTCs (1/2)	10. Valid cases for use of FTCs		(1/2)	(1/2)
		11. Maximum number of successive contracts		(1/4)	(1/4)
		12. Maximum cumulated duration		(1/4)	(1/4)
	Temporary work agency employment (1/2)	13. Types of work for which is legal		(1/2)	(1/3)
		14. Restrictions on number of renewals		(1/4)	(1/6)
		15. Maximum cumulated duration		(1/4)	(1/6)
		16. Authorization and reporting		–	(1/6)
		17. Equal treatment		–	(1/6)

Source: OECD, 2014.

Table A2. Coding scheme EPL

	Original unit and short description		Assignment of numerical strictness scores						
			Assigned scores						
			0	1	2	3	4	5	6
Definition of justified or unfair dismissal	0	When worker capability or redundancy of the job are adequate and sufficient grounds for dismissal	Scale (0–3) × 2						
	1	When social considerations, age, or job tenure must when possible influence the choice of which worker(s) to dismiss							

(continued)

Table A2. Continued

	Original unit and short description	Assignment of numerical strictness scores						
		Assigned scores						
		0	1	2	3	4	5	6
	2 When a transfer and/or a retraining to adapt the worker to different work must be attempted prior to dismissal							
	3 When worker capability cannot be a ground for dismissal							
Maximum number of successive FTC	Number	No limit	≥5	≥4	≥3	≥2	≥1.5	<1.5
Maximum cumulated duration of successive FTC	Months	No limit	≥36	≥30	≥24	≥18	≥12	<12

Source: OECD, *2014*.

Table A3. Country characteristics

Country	Job security provisions[a]		Regulations on temporary employment[a]		Unemployment rate[b]	
	(2004)	(2010)	(2004)	(2010)	(2004)	(2010)
AT	2		2.5		5.8	
BE	0	0	2	2	8.5	8.3
BG		–		–		–
CH	–	0	–	2.5	–	4.5
CY		–		–		–
CZ	4	0	0	1.5	8.2	7.3
DE	4	4	1.5	1.5	10.7	7.1
DK	0	0	3.5	3.5	5.5	7.5
EE	–	4	–	2.5	–	16.7
ES	4	4	3	3	11.1	19.9
FI	4	4	2	2	10.4	8.4
FR		4		4		8.9
GB	0	0	0.5	0.5	4.6	7.8
GR	1	1	3	3	10.5	12.5
HR		–		–		–
HU	0	0	2.5	2.5	5.8	11.2
IE	–	0	–	0.5	–	13.9
IL		0		0	9.3	6.0
IS	0		0.5		4.0	
LT		–		–		–
LU	–		–		–	
NL	3	3	2	2	4.6	4.5
NO	5	5	2.5	3	4.3	3.5
PL	0	0	2	2	19.1	9.6
PT	5	5	1.5	1.5	6.3	10.8
RU		5		1		7.3
SE	4	4	3	1.5	6.7	8.6
SI	–	4	–	1.5	–	7.2
SK	0	0	1.5	2.5	18.6	14.4
TR	–		–		–	
UA	–	–	–	–	–	–

Note: – included in the ESS, but EPL not available.
Source: [a]Based on OECD, 2014; [b]ILO, 2015.

Table A4. Descriptive statistics of the variables

	Mean 2004	Mean 2010	Minimum	Maximum
Fixed-term contract (FTC)	0.136	0.120	0	1
Education				
ISCED 0–2	0.189	0.121	0	1
ISCED 3–4	0.486	0.477	0	1
ISCED 5–6	0.325	0.402	0	1
'easy to replace' (1–10)	6.141 (2.651)	5.840 (2.683)	0	10
Training period				
<1 day	0.033	0.034	0	1
2–6 days	0.087	0.087	0	1
1–4 weeks	0.172	0.160	0	1
1–3 months	0.228	0.221	0	1
3 months to 1 year	0.281	0.283	0	1
1–2 years	0.118	0.128	0	1
2–5 years	0.064	0.067	0	1
More than 5 years	0.017	0.020	0	1
Age (years)				
20–29	0.179	0.164	0	1
30–39	0.280	0.259	0	1
40–54	0.409	0.413	0	1
55–67	0.132	0.164	0	1
Part-time	0.149	0.164	0	1
Female	0.482	0.510	0	1
Child	0.516	0.515	0	1
Unemployed in past 5 years	0.122	0.111	0	1
Unemployed more than 12 months	0.093	0.090	0	1
Firm size				
<10	0.221	0.208	0	1
10–24	0.209	0.191	0	1
25–99	0.271	0.267	0	1
100–499	0.180	0.188	0	1
>500	0.120	0.146	0	1
Industry				
1 Agriculture	0.028	0.023	0	1
2 Manufacturing industry	0.183	0.172	0	1
3 Construction	0.062	0.060	0	1
4 Trade	0.115	0.111	0	1
5 Transport/infrastructure	0.077	0.115	0	1
6 Finance	0.036	0.036	0	1
7 Public administration	0.077	0.073	0	1
8 Education	0.110	0.105	0	1
9 Health sector	0.139	0.125	0	1
10 Service	0.174	0.180	0	1

Note: Only for cases included in the analysis. Standard deviations in brackets (not for dichotomous variables).
Source: ESS 2004; unweighted results; $N = 10{,}029$; ESS 2010; unweighted results; $N = 13{,}949$.

Table A5. Complete results of the multilevel analysis

	Model 1		Model 2	
	Coeff.	Std. Err.	Coeff.	Std. Err.
Fixed-term contract (FTC)	0.524**	(0.048)	0.211	(0.137)
Country variables				
Job security provisions	−0.004	(0.024)	−0.037	(0.028)
Regulations on temporary employment	0.005	(0.051)	−0.059	(0.059)
Unemployment rate	0.023*	(0.012)	0.023†	(0.014)
Cross-level interactions				
FTC*job security provisions			0.050*	(0.021)
FTC*regulations on temporary employment			0.096*	(0.045)
FTC*unemployment rate			0.001	(0.010)
Individual controls				
Education (reference: ISCED 0–2)				
ISCED 3–4	0.016	(0.019)	0.016	(0.019)
ISCED 5–6	−0.044*	(0.021)	−0.044*	(0.021)
'easy to replace'	0.030**	(0.002)	0.030**	(0.002)
Training period (reference: <1 day)				
2–6 days	0.028	(0.038)	0.029	(0.038)
1–4 weeks	−0.010	(0.036)	−0.010	(0.036)
1–3 months	−0.024	(0.036)	−0.024	(0.036)
3 months to 1 year	−0.094**	(0.036)	−0.094**	(0.036)
1–2 years	−0.118**	(0.038)	−0.117**	(0.038)
2–5 years	−0.149**	(0.041)	−0.148**	(0.041)
More than 5 years	−0.124*	(0.055)	−0.124*	(0.055)
Age (reference: 20–29 years)				
30–39	0.129**	(0.019)	0.129**	(0.019)
40–54	0.143**	(0.019)	0.143**	(0.019)
55–67	0.043*	(0.022)	0.044*	(0.022)
Part-time	−0.064**	(0.018)	−0.065**	(0.018)
Female	0.032*	(0.013)	0.032*	(0.013)
Child	−0.030*	(0.013)	−0.030*	(0.013)
Unemployed in past 5 years	0.224**	(0.021)	0.223**	(0.021)
Unemployed more than 12 months	0.098**	(0.022)	0.098**	(0.022)
Company and industry controls				
Firm size (reference: >10)				
10–24	0.031*	(0.019)	0.031†	(0.019)
25–99	0.020	(0.018)	0.020	(0.018)
100–499	0.000	(0.020)	0.000	(0.020)
>500	−0.021	(0.022)	−0.020	(0.022)
Industry (reference: 10 Service)				
1 Agriculture	−0.033	(0.041)	−0.033	(0.041)
2 Manufacturing industry	0.096**	(0.021)	0.096**	(0.021)
3 Construction	0.046	(0.029)	0.046	(0.029)
4 Trade	0.030	(0.023)	0.030	(0.023)
5 Transport/infrastructure	0.000	(0.024)	−0.000	(0.024)
6 Finance	0.044	(0.035)	0.044	(0.035)
7 Public administration	−0.256**	(0.026)	−0.255**	(0.026)
8 Education	−0.266**	(0.024)	−0.265**	(0.024)
9 Health sector	−0.217**	(0.022)	−0.217**	(0.022)
Constant	1.713**	(0.163)	1.917**	(0.184)

(continued)

Table A5. Continued

	Model 1		Model 2	
	Coeff.	Std. Err.	Coeff.	Std. Err.
Variance components				
FTC (random slope)	0.073	(0.020)	0.057	(0.017)
Country	0.127	(0.032)	0.120	(0.030)
Covariance (FTC, constant)	−0.057	(0.021)	−0.045	(0.020)
Individual	0.830	(0.008)	0.830	(0.008)
Explained variances				
Explained variance of random slope[a]	–		0.227	
R^2 (individual)[b]	0.107		0.110	
R^2 (country)[b]	0.229		0.230	
M	39		39	
N	23,978		23,978	

Note: $^{\dagger}P < 0.10$, $^{*}P < 0.05$, $^{**}P < 0.01$; Standard errors in parentheses.

[a]Reduction in variance = $(\text{var(FTC)}_{M1} - \text{var(FTC)}_{M1})/\text{var(FTC)}_{M1}$.

[b]*R*-squared as proposed by Snijders and Bosker (1994: 350–354); also see Snijders and Bosker (1999: 99–105).

Source: Estimations from the random intercept and random slope model (restricted maximum likelihood); ESS 2004 and 2010.

2004: AT, BE, CZ, DE, DK, ES, FI, GB, GR, IS, NL, NO, PL, PT, SE, SK, TR.

2010: BE, CH, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IL, NL, NO, PL, PT, RU, SE, SI, SK.

Table A6. Outlier analysis of the cross-level interaction effects

	b_{FTC}*job security provisions	b_{FTC}*regulation on temporary employment	DFBETA$_{FTC}$*job security provisions	DFBETA$_{FTC}$*regulation on temporary employment
All countries included	0.050	0.096		
Model without				
AT 2004	0.050	0.100	0.029	0.080
BE 2004	0.059	0.094	**0.396**	0.044
BE 2010	0.056	0.094	**0.281**	0.037
CH 2010	0.048	0.099	0.112	0.061
CZ 2004	0.055	0.074	**0.243**	**0.482**
CZ 2010	0.049	0.095	0.042	0.012
DE 2004	0.049	0.097	0.047	0.025
DE 2010	0.051	0.095	0.028	0.014
DK 2004	0.045	0.112	**0.254**	**0.344**
DK 2010	0.048	0.102	0.099	0.132
EE 2010	0.055	0.097	**0.200**	0.024
ES 2004	0.046	0.086	**0.197**	**0.218**
ES 2010	0.043	0.088	**0.346**	**0.169**
FI 2004	0.045	0.098	**0.256**	0.034
FI 2010	0.048	0.096	0.094	0.004
FR 2010	0.050	0.094	0.000	0.042
GB 2004	0.052	0.101	0.083	0.102
GB 2010	0.053	0.105	0.110	**0.182**
GR 2004	0.050	0.100	0.031	0.077
GR 2010	0.049	0.101	0.053	0.105
HU 2010	0.051	0.095	0.047	0.031
IE 2010	0.052	0.103	0.080	0.152
IL 2010	0.053	0.108	0.133	**0.244**
IS 2004	0.050	0.095	0.029	0.016

(continued)

Table A6. Continued

	b_{FTC}*job security provisions	b_{FTC}*regulation on temporary employment	DFBETA$_{FTC}$*job security provisions	DFBETA$_{FTC}$*regulation on temporary employment
NL 2004	0.051	0.097	0.043	0.019
NL 2010	0.051	0.097	0.041	0.020
NO 2004	0.051	0.096	0.026	0.004
NO 2010	0.050	0.096	0.001	0.004
PL 2004	0.050	0.096	0.006	0.002
PL 2010	0.048	0.097	0.101	0.015
PT 2004	0.045	0.101	**0.232**	0.105
PT 2010	0.057	0.090	**0.304**	0.142
RU 2010	0.057	0.084	**0.322**	**0.267**
SE 2004	0.048	0.089	0.101	**0.165**
SE 2010	0.046	0.102	**0.206**	0.136
SI 2010	0.053	0.092	0.131	0.092
SK 2004	0.045	0.085	**0.235**	**0.253**
SK 2010	0.046	0.100	**0.191**	0.101
TR 2004	0.053	0.093	0.115	0.065

Note: DFBETA = ($b1-b2$)/s.e.($b2$), where $b1$ is the original b (Table1, Model 2), and $b2$ is the b without the listed country. Critical values above $1/\sqrt{n}$ (0.16) are bold.

Source: ESS 2010, ESS 2004, own calculations.